

REMARKS

Claims 1-4, 6-15, 17 and 21-27 are now pending in the application. Claims 1, 7, 17, 22 and 26 have been amended. Claims 5, 16, and 18-20 are canceled. Support for the foregoing amendments can be found throughout the specification, drawings, and claims as originally filed. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

REJECTION UNDER 35 U.S.C. § 103

Claims 1, 3-4, 6-7, 10, 14, 16-17 and 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Koumura et al. (U.S. Pat. No. 4,463,361) in view of Kitahara et al. (U.S. Pub. No. 2002/0018097).

Claims 8-9 and 21-22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Koumura et al. (U.S. Pat. No. 4,463,361) and Kitahara et al. (U.S. Pub. No. 2002/0018097) and further in view of Yasui et al. (U.S. Pat. No. 6,416,176).

Claim 13 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Koumura et al. (U.S. Pat. No. 4,463,361) and Kitahara et al. (U.S. Pub. No. 2002/0018097) and further in view of Martin et al. (U.S. Pat. No. 5,255,020).

Claim 24 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Koumura et al. (U.S. Pat. No. 4,463,361) and Kitahara (U.S. Pub. No. 2002/0018097) and further in view of Greive (U.S. Pat. No. 6,834,949)

Claim 25 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Koumura et al. (U.S. Pat. No. 4,463,361) and Kitahara et al. (U.S. Pub. No. 2002/0018097) and further in view of Baldwin-Garcia (U.S. Pub. No. 2003/0016983).

These rejections are respectfully traversed.

In the outstanding Office action, the Examiner relies upon Koumura for teaching the claimed features with respect to the pressure source. Applicant has amended claim 1 to more clearly point out the claimed subject matter. Claim 1 recites that

| a pressure source arranged to apply a negative gauge pressure to the
| substrate to hold the substrate to the rollers in the region of the printhead
| arrangement;

| a mask element arranged between first and second rollers of the plurality of
rollers such that a first gap is defined between the mask element and the first roller as
well as a second gap between the mask element and the second roller, wherein the
mask element throttles airflow caused by the negative gauge pressure through the first
and second gaps;

Applicant submits that Koumura fails to teach or suggest the above features.

Koumura states:

The recording paper 2 is drawn to the suction plate 20 by the fan 21 and brought into the state of intimate contact with the suction plate thereby flattening the paper on the suction plate. With this high flatness of the recording paper 2 on the suction plate 20, the distance between the recording paper 2 and the heads 22, 23 is maintained always constant. Column 2, line 67 to column 3, line 4.

The recording paper 2 is carried toward the recording head 23 passing through the paper guide paths 17 and 18 as previously mentioned. At this stage, the recording paper 2 is squeezed through the gap between the suction plate 20 and the elastic guide 25 to eliminate curls or the like in the paper. Since, as previously noted, the maximum width of the area of openings 28 on the suction plate 20 is smaller than the width of the recording paper, there is no possibility that the corner portion of the leading edge of the recording paper 2 may engage in the opening 28. Therefore, in the area of the recording head 23, the recording paper 2 is surely drawn onto the suction plate 20 and flattened under the action of suction force. Thereby the desired flatness of the recording paper is attained and the distance between the recording paper 2 and the recording head 23 is maintained constant, which improves the recorded image quality. Column 4, lines 6-23. (emphasis added)

In other words, as shown in Figure 2 of Koumura, when paper 2 passes through the rollers 7a, 7b, 8a, 8b, 9a, 9b and suction plates 20, the pressure generated by the fan 21 hold the paper on the suction plate, rather than to the rollers.

Further, Koumura at column 3, lines 34-51 states

That the suction plate is stationary is an important feature of the invention. The recording paper 2 is carried in the direction of arrow C. The large number of the air suction holes 28 extend over a distance smaller than the width of the recording paper in the direction intersecting the direction C. In other words, the distance between the leftmost row of holes 28 and the rightmost row of holes 28 is selected to be smaller than the full width of the recording paper 2. The reason for this is that if the air suction holes 28 are present over the full width of the recording paper, the leading corner edges of the recording paper may engage in some of the holes. This may result in folding or wrinkling of the paper, change in moving speed of the paper or jamming. According to the invention, these troubles are completely eliminated. For the same reason, the openings 27 on the paper guide path 26A have a smaller width than the full width of the recording paper 2. (emphasis added)

In other words, the suction plate of Koumura has a large number of air suction holes 28 such that the suction plate primarily throttles airflow caused by the fan 21 through the air suction holes 28, rather than through the gaps (if any) between the suction plates 20 and the rollers 7a, 7b, 8a, 8b, 9a, 9b. *In particular, there is no equivalent structure in Koumura to applicant's claimed "mask elements" whose function is described, for example, beginning on page 14, line of applicant's specification.*

The specification originally filed at page 2, lines 26 to page 3, line 2 discusses the distinctions between one or more embodiments of claim 1 and some existing ink jet printers. It states

Some existing ink jet printers use vacuum in combination with conveyor belts and rollers to transport a substrate to be printed, see for example FIGS. 9a and 9b of JP 10-315551. Such systems are designed to index the substrate between the printing of print swathes, and to hold the substrate while ink is emitted by the printhead. A vacuum may be used to

hold the substrate against a platen or belt, to maintain a uniform gap between the printheads and the surface of the substrate. Linear speed of movement of the substrate is low, typically 0.1 m/s, since the index distance between swathes is small, typically 1 cm. Such systems are able only to handle flexible substrates such as paper. Single pass printing at speeds over 1 m/s on rigid materials such as corrugated board requires a different approach.

In fact, FIGs. 9a and 9b of JP 10-315551 as mentioned above show a printer structure similar to the structure shown in Koumura. Applicant submits that the distinctions between claim 1 and Koumura are significant. The printer shown in Koumura with a suction plate, which draws the substrate onto the suction plate and flattens the substrate under the action of suction force, is able only to handle flexible substrates such as paper. In contrast, one or more embodiments of claim 1 are able to conduct single pass printing on rigid materials such as corrugated board.

Claim 13 recites that “apparatus is adapted to move the substrate at a speed greater than 1m/s.” The Examiner has acknowledged that Koumura and Kitahara do not teach or suggest the claimed features, but relies on Martin to cure the deficiencies of Koumura and Kitahara. Applicant respectfully disagrees with the Examiner.

Koumura is directed to the desktop recording apparatus (see e.g. column 1, lines 7-13). As discussed at page 2, lines 26 to page 3, line 2 of the specification originally filed, systems such as the one shown in Koumura is not able to print at a speed over 1m/s. Martin is directed to an industrial printing assembly for stamping articles such as letters. The assembly of Martin uses endless belts for moving articles. Applicant respectfully submits that one skilled in the art would not be motivated to or would not know how to modify the desktop recording apparatus of Koumura based on the teaching

with respect to the industrial printing assembly shown in Martin in order to arrive at a desktop recording apparatus that moves paper at a speed greater than 1m/s.

Further, if proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). See also MPEP 2143.01. Applicant submits that, as indicated on page 2, lines 26 to page 3, line 2 of the specification originally filed, the proposed modification to the recording apparatus of Koumura would render the printing mechanism and the suction plate of the modified recording apparatus unsatisfactory for its intended purpose. Thus, Applicant submits that one skilled in the art would not be motivated to make such a modification.

In addition, Applicant has rewritten the previously presented claim 22 as an independent claim. No new matter has been introduced. Applicant notes that if the Examiner relies upon new grounds of rejection to reject claim 22 in a next Office action, the next Office action should not be final.

Claim 22 recites “the element is substantially non-porous.” In rejecting claim 22, the Examiner has acknowledged that Koumura and Kitahara do not teach or suggest the above features, but relies upon Yasui to cure the deficiencies of Koumura and Kitahara. Applicant respectfully disagrees with the Examiner.

Column 5, lines 16-22 of Yasui states (also shown in Figure 2),

the sheet attracting member is constituted by the sheet guide member 27 with the air vents 28, the duct 29 and the fan 30. By the flow of air generated by the fan 30, the sheet attracting member pneumatically attracts the copy sheet 3 at the print position to the sheet guide member 27 during the transport of the copy sheet 3.

In other words, the sheet guide member 27 has the air vents 28 and is not non-porous.

In view of the foregoing, Applicant submits that claim 1 and its dependent claims 2-4, 6-15, 21 and 23-25 as well as claim 22 define over the art cited by the Examiner.

Claims 17, 26, and 27 each recite features similar to the above distinguishing features of claim 1. Thus, Applicant submits that claims 17, 26 and 27 define over the art cited by the Examiner for one or more of the reasons set forth above with respect to claim 1.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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